

# XenSummit

(Free and Net)BSD on Xen Roadmap

## BSD/Xen Userbase

- Primary FOSS virtualisation solution (no kvm :-)). L4, BHyVe is a potential competitor.
- Build clusters (NetBSD, FreeBSD, Corporates)
- Amazon amis

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A panoramic view of a city skyline with various skyscrapers under a clear blue sky.

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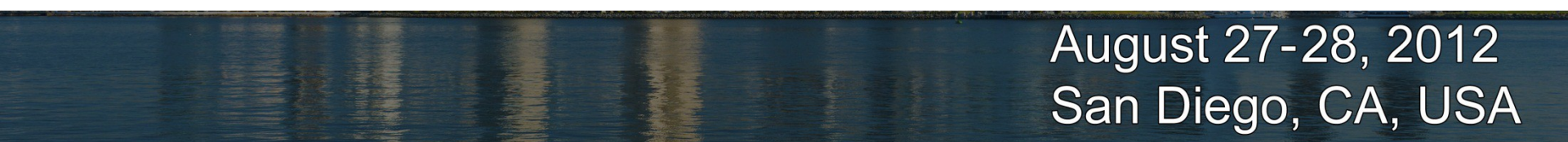
## **BSD/Xen History**

- **NetBSD**

- Christian Limpach (i386, xen1.0)
- Manuel Bouyer (amd64, xen 2.0, dom0)
- Jean Yves-Migeon (suspend/resume)

- **FreeBSD**

- Colin Percival
- Kip Macy (i386, domU)
- Justin Gibbs (PV drivers)

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### **(Net|Free)BSD dev cycle**

- Development on central repository Head (NetBSD – CVS, FreeBSD – SVN)
- Release/feature-dev Branches
- Feature-dev branches eventually merge and become redundant
- Release branches:
  - Managed by "releng" team
  - Periodic "pullups"

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### BSD/Xen Features

Feature/ OS	Dom0	Suspend/ Resume	PCI- passthrough Y	PV/HVM	Balloon Driver
FreeBSD	WIP	N	(experimental)	PV(32bit)HVM	Y
NetBSD	Y	Y	Y (backend)	PV, HVM	Y
OpenBSD	-	-	-	-	-
Dragonfly BSD	-	-	-	-	-

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## (Free and Net)BSD on Xen Roadmap

### **Planned work/FreeBSD**

- DomU/0 support for 64bit (cherry)
- Unified xen tools (roger)

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## (Free and Net)BSD on Xen Roadmap

### **Planned work/NetBSD**

- Dom0 multi-processor (cherry)
- Balloon "hotplug" (cherry)
- PV drivers for HVM guests (jym, bouyer)
- Testing Framework (jym)

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### Userspace Roadmap

- Added NetBSD support to libxl [done](roger)
- Improve NetBSD hotplug scripts: (roger)
  - ISCSI support
- Better documentation (roger)
- FreeBSD libxc glue (for dom0) (roger)

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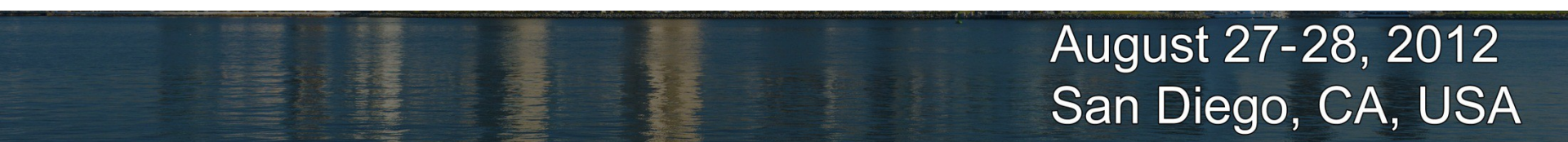
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### **Benchmarks**

- Objectives:
  - Comparative status of NetBSD and Linux Dom0/DomU
  - Demonstrate strong and weak points of each implementation
  - Can be used to detect possible points of improvement

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### Benchmarks

- Physical server information:
  - Intel Xeon CPU X3450 @ 2.67GHz
  - 8 ways (4 cores with HT)
  - 8GB RAM



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### Benchmarks

- Xen:
  - 4.2.0-rc2
  - Compiled from source on both NetBSD and Linux
  - 64bits Hypervisor, Dom0/DomU and tools



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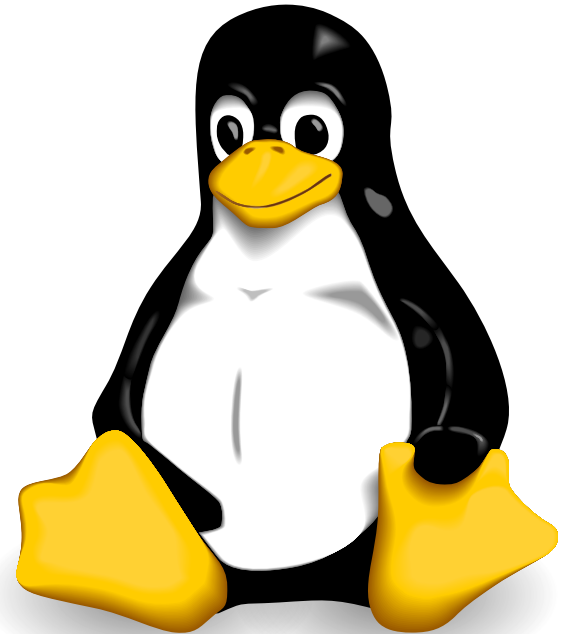


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### Benchmarks

- Linux (Dom0/DomU):
  - Debian 7.0 BETA1
  - Stock kernel 3.2.0-3
  - Ext3 file system



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### Benchmarks

- NetBSD (Dom0/DomU):
  - 6.0 BETA2
  - XEN3\_DOM0 and XEN3\_DOMU generic kernels used
  - FFSv2 file system (UFS2)



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### Benchmarks

- Dom0 Configuration:

	File IO	Build
Memory	4096M	1024M
vcpus	1	1

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### Benchmarks

- DomU Configuration:

	File IO	Build
Memory	800M	2048M
vcpus	1	4

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### Benchmarks

- Configuration:
  - Test was run inside DomU, with only one DomU running and idle Dom0
  - Sysbench 0.4.12 used as benchmark tool:
    - <http://sysbench.sourceforge.net/>
  - NetBSD build used as benchmark:
    - <http://cvsweb.netbsd.org/>

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### Benchmarks

- Summary of tests:
  - File IO: sequential read, write and random read, write with a total transferred size of 2Gb in both cases. Data split into 128 files, of size 16Mb each. Run 7 times and averaged
  - CPU/Memory/File IO: build of the NetBSD system. Run 5 times and averaged.

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### Benchmarks

(All results are in seconds, lower is better)

File sequential read:

		Dom0	
		NetBSD	Linux
DomU	NetBSD	4,2815	4,4717
	Linux	2,1179	1,1948

File sequential write:

		Dom0	
		NetBSD	Linux
DomU	NetBSD	4,1493	4,1227
	Linux	3,2412	3,2669

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### Benchmarks

(All results are in seconds, lower is better)

File random read:

		Dom0	
		NetBSD	Linux
DomU	NetBSD	6,5005	6,8130
	Linux	6,0676	6,3004

File random write:

		Dom0	
		NetBSD	Linux
DomU	NetBSD	40,9817	41,0577
	Linux	11,7237	12,0696

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### Benchmarks

- Conclusions of File IO benchmarks:
  - Linux DomU performs better than NetBSD
  - NetBSD Dom0 performs better than Linux
  - There's a problem in NetBSD blkfront when doing random writes (Linux is ~71% faster)
  - Sequential file reads should also be looked at. Linux performs between 50-70% better than NetBSD in some cases

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### Benchmarks

(All results are in seconds, lower is better)

Build.sh:

		Dom0	
		NetBSD	Linux
DomU	NetBSD	2574.73	
	Linux	2329.08	2295.60

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### **Benchmarks**

- Conclusions of build.sh benchmark:
  - Linux DomU is faster
  - Both NetBSD and Linux Dom0 have similar performance

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## (Free and Net)BSD on Xen Roadmap

### Benchmarks

- General remarks:
  - Linux DomU performs better than NetBSD
  - Performance as Dom0 is similar
  - NetBSD needs performance adjustments in blkfront
  - Possible protocol problem between Linux blkback and NetBSD blkfront

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## Rants/Questions

- Advice to Luke is not DOCUMENTATION! :-)
- OS/toolchain dependencies

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## Thank You

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